REMARKS

Reconsideration is respectfully requested.

Amendments have been proposed to overcome the objections under 35 U.S.C.§ 112, second paragraph. The amendments find support in the specification as originally filed at Pages 6 – 9. With regard to the asserted indefiniteness of "non-diffraction regions", there is an explanation of such term found at Page 8 of the specification as originally filed. That is, since a diffraction region is defined as being region that "upon illumination by a light source . . . . generates one or more diffraction images which are observable from one or more ranges of viewing angles 6 around the device." By the process of elimination, a "non-diffraction region" is one that does not have this property, and thus does not achieve diffraction of reflected light, and consequently is differentiated from the diffraction region, as defined. Since the claims are read in view of the disclosure, it is respectfully submitted that the term, as defined in the specification, is not indefinite.

With respect to the rejection made under 35 U.S.C.§ 112, first paragraph, it is understood from the office Action dated February 1, 2001 that the assertions are that the terms:

a) "a particular shade of gray when viewed from any direction"

b) "different gray scale region structure types" and,

c) "micrographic region structure types"

are considered to be vague or indefinite because they are asserted to be not described so as to enable a person having ordinary skill to make or use the invention.

It is respectfully suggested that the rejection is improper in that a person having ordinary skill in the art would be put in possession of the invention from an understanding reached after study of the specification as originally filed. For example, with respect to the second assertedly

indefinite term b), "differing gray scale structure types" are described in the originally filed specification at Page 3, lines 11-27. As would have been evident to a person having ordinary skill from a study of this description, the differing types of gray scale regions "have one or more graphic elements, line art or images represented in microscopic size in their surface relief structures," resulting in multiple replication of the graphic elements, so that by viewing the different regions from a predetermined distance, i.e., macroscopic regions, "differing diffuse scattering characteristics" are noted by the viewer.

Additional description for the term is also provided at Page 6, of the specification, where the images are said to comprise "graphic elements such as alpha numeric characters or recognizable shapes, line art drawings or other images." Incidentally, these graphic elements are microscopic in nature, visible under "microscopic examination of the diffuse scattering regions" which provides support for term c), "micrographic region structure types," (the term, is also noted at Page 9 of the specification). The diffusive characteristics of these images and of the gray scale regions can be altered by varying a number of factors listed at page 6, lines 7-13.

The term a) "particular shade of gray when viewed from any direction" finds resonance in the description at Page 8, lines 1-6, and is further described below with reference to the response to the prior art rejection differentiating the Lee patent. Thus, it is respectfully submitted that a person having ordinary skill in the art would have been in possession of the invention, as recited in the claims by utilizing generalized knowledge in the field to interpret the language of the claims in view of the description of the recited claim terms as defined in the specification.

With regard to the rejection under 35 U.S.C.§ 103 based on the cited patent, U.S. Patent No. 5,428,479, (Lee), who is also one of the inventors of the present invention, the following comments are offered.

Lee teaches a device which utilizes diffraction (and not diffusion as in the present invention). The diffractive surface relief structures taught by Lee results in these zero order, first order, second order, etc., images. That is, each diffraction image can be viewed from particular ranges of viewing angles around a diffractive device. The images cannot be viewed from any direction, they can only be viewed from the positions defined by the specific direction defining the zero order, first order, etc. Each diffraction image is therefore optically invariable by its nature. To achieve an image that can be viewed from other positions, Lee provides for a number of diffraction invariable images (which can each be viewed from specific positions); this gives the viewer the impression that they are actually viewing the same image from various positions. What they are really viewing is a number of different invariable diffraction images. The citation combines these invariable diffraction images to give an impression that the image is in fact invariable. However, what is really being created is an "optically variable reproduction of said optically invariable image" [see Column 2, Lines 19-21]. In summary, Lee combines a number of optically invariable images that are identical, then the image appears to be invariable. This is, however, not a single optically variable image but a number of invariable images, which give the appearance of invariability.

In the present invention, Applicants claim a device that teaches away from the teaching of Lee, that is diffraction, and have utilized a wholly different approach that utilizes diffusion. The diffusive nature of the surface "diffusely scatters light in all directions." This allows for the images of the present invention to be viewed from any direction (not from specific viewing

directions) and hence it provides invariability. This provides a single optically variable image (as opposed to multiple invariable images, caused by diffraction, which are combined to give an impression of a single optically variable image). When a reflective surface is substantially flat, incident light will bounce back into the eye of the observer, and the surface will appear to be bright. When the surface is rough and irregular, like a rocky outcrop, light will bounce off in all directions and only a small proportion will bounce back to the eye of the observer. Accordingly, the surface will appear to be dark. Thus a surface which is "rockier" will have greater diffuse scattering characteristics and will appear to be a darker shade of gray, whereas a surface which is flatter and smoother will have lesser diffuse scattering characteristics and will appear to be a lighter shade of gray. The present invention, as claimed, therefore distinguishes Lee on this basis.

The present invention can also be distinguished from Lee because of the appearance of the different gray scale region types. These gray scale regions obtain different intensities by reason of their diffuse scattering characteristics. This use of diffusion in the present invention is different to and teaches away from the use of diffraction, as taught by Lee, a common inventor, in U.S. Pat. No. 5,428,479. As discussed above, Lee teaches an image that is not an optically variable image but is a reproduction comprising a plurality of images, and hence Lee fails to teach gray scale or intensities that are optically invariable. There is also no teaching in Lee of a limited number of gray scale region types having different intensities, which different intensities can provide by reason of their differing diffuse scattering characteristics, different shades of gray.

Referring specifically to the matters raised in the Office Action, a region with "diffuse scattering characteristics" will inevitably appear to an observer to have "a particular shade of gray when viewed from any direction", because diffuse scattering is by definition non-

directional. This contrasts the present invention with the prior art, in which individual regions are diffractive regions are utilized to differentiate by virtue of the specific viewing angle, and where the diffraction images generated are observable only from limited ranges of viewing angles around the device. It is respectfully submitted that neither Lee, nor any of the other cited references, meet this limitation so as to provide the proper basis for rejection..

For the above reasons, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections and earnestly solicit an indication of allowable subject matter.

Respectfully submitted,

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MARKED UP COPY OF CLAIMS

19. (Amended) A device having a surface relief structure which has a plurality of regions,

wherein the regions include gray scale regions, which are too small to be separately resolvable to the human eye, being smaller than 0.25 mm in width,

each gray scale region being one of a limited number of different gray scale region structure types, each having a surface structure which diffusely scatters light in all directions,

the different gray scale region types appearing, by reason of their differing diffuse scattering characteristics, to have different intensities when the device is illuminated by a light source and viewed by an observer from any direction.

24. (Amended) A device having a surface relief structure which has a regular array of regions, each region being too small to be separately resolvable to the human eye, being smaller than 0.25 mm in width, wherein a large number of regions are micrographic regions with diffuse scattering characteristics to diffusely scatter light in all directions, each micrographic region having one or more graphic elements, line art or text images presented in microscopic size in its surface relief structure so that each micrographic region appears to an observer to be a particular shade of gray when viewed from any direction.

29. (Amended) A device according to claim 28, wherein in addition to the diffracting regions, the device includes one or more non-diffracting regions which provide a contrast enhancing dark background to the diffraction image or images.

30. (Amended) A device according to claim 28, wherein in addition to the diffracting regions, the device includes one or more non-diffracting regions which provide gray scale enhancement to the diffraction image or images.

33. (Amended) A device having a surface relief structure which has a plurality of light scattering regions, each region having a number of structures which scatter incident light in all different directions, so that the region appears to an observer to be a particular shade of gray when viewed from any direction.

34. (Twice Amended) A valuable document incorporating a device according to one of claims 19, 24 or 33 including printing [on the valuable device] which matches up with, and appears when viewed to be continuous with regions on the device [which have a printed appearance] that appear when viewed to also be printed thereon.